LA-UR-18-31629
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Title:	Preface: 18th Advanced Accelerator Concepts Workshop (AAC 2018)
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Intended for:	Advanced Accelerator Concepts Workshop, 2018-08-12 (Breckenridge, Colorado, United States)
Issued:	2018-12-12

Preface: 18th Advanced Accelerator Concepts Workshop (AAC 2018)

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***Abstract*—The Eighteens Workshop on Advanced Accelerator Concepts (AAC 2018) was held at the Beaver Run Resort and Conference Center in Breckenridge, Colorado, USA on August 12-17, 2018. This paper prefaces a set of 67 conference proceedings published by the presenters and attendees of the Workshop and summarizes the proceedings and the Workshop.**

Keywords—Advanced Accelerator Concepts, accelerator conferences.

The Eighteens Workshop on Advanced Accelerator Concepts (AAC 2018) was held at the Beaver Run Resort and Conference Center in Breckenridge, Colorado, USA on August 12-17, 2018. The workshop was hosted by the Institute of Electrical and Electronic Engineers (IEEE) Council on Superconductivity, with the support of the Office of High Energy Physics of the United States Department of Energy, National Science Foundation, and Tech-X [1]. The workshop was co-chaired by Benjamin Cowan from Tech-X and Evgenya Simakov from Los Alamos National Laboratory (LANL). The Local Organizing Committee was comprised of scientists from Los Alamos National Laboratory, Tech-X, and University of Colorado in Boulder. Other AAC 2018 industry sponsors were the Radiasoft [2], Euclid Techlabs [3], and Radiabeam Technologies [4] with the last two companies jointly funding the Advanced Accelerator Concepts (AAC) Prize.

The workshop was the eighteens in a biennial series that began at Los Alamos National Laboratory in 1982 with a workshop on Laser Acceleration of Particles [5]. The scope of the AAC 2018 Workshop now encompasses a broad range of topics related to advanced accelerator science and technology which are beyond the scope of conventional accelerator technics. The Workshop was attended by 278 scientists from North America, Europe, and Asia/Middle East, including 96 students. Sixteen per cent of the workshop participants identified as women including 19% of the working group leaders, 33% of the plenary speakers, and 46% of all students.

The eight Working Groups of the AAC 2018 Workshop were organized as follows. Working Group 1 was focused on laser-driven electron acceleration in plasma. Working Group 2 dealt with computational tools for simulating advanced accelerators. Working Group 3 studied high gradient structure-based acceleration, both radio-frequency (rf) driven and laser driven. Working Group 4 concerned with beam-driven particle acceleration in plasma and in structures. Working Group 5 discussed beam sources, monitoring, control, and advanced accelerator diagnostics. Working Group 6 focused on laser-driven acceleration of ions. The relatively new Working Group 7 was concerned with radiation generation by the advanced accelerators and other advanced concepts. Working Group 8 reviewed the laser technology and accelerator facilities available for the advanced accelerator research. The workshop hosted the first Career Development event featuring Prof. Patricia Rankin from University of Colorado in Boulder talking on "From Good Intentions to Strategy: Improving Opportunities in Physics".

The sixth AAC Prize for outstanding contributions to the science and technology of the advanced accelerator concepts was awarded to Dr. Eric Esarey from Lawrence Berkeley National Laboratory. The prize was awarded "for his pioneering theoretical research in the physics of laser-plasma accelerators". Prizes were also awarded for outstanding student poster presentations, with the winners selected by the leaders of the Working Groups, and the selection committee chaired by Dr. Daniel Gordon (Naval Research Laboratory). The winners were: Liona Fan-Chiang, Chen-Kang Huang, Emma Snively (Curry), Xueying Lu, Hiroki Fujii, Maxwell LaBerge, Lieselotte Obst, and Andrea Hannasch.

These Proceedings contain 67 papers including 8 working group summaries. These Proceedings are organizes as follows. First the eight working group summaries prepared by the leaders of the Working Groups are published in order of the working group numbers. Next, all proceedings are published organized by the working groups.

We wish to thank the Program Committee and the Working Group leaders for their time and effort in preparing the program, running the workshop, and summarizing the results. We wish to thank the Local Organizing Committee for their important efforts of putting the workshop together. We thank Prof. Michael Downer, Prof. James Rosenzweig, and Prof. John Cary for presenting the student tutorials. We thank the workshop management team from Centennial Conferences for their help with organizing and running the workshop. Finally we would like to thank the AAC Core Committee for maintaining the AAC workshop series and its continuous leadership in advanced accelerator community.

REFERENCES

[1] Tech-X, www.txcorp.com

[2] Radiasoft, www.radiasoft.net

[3] Euclid Techlabs, www.euclidtechlabs.com

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[5] P. J. Channell, "Brief Report on The Laser Acceleration of Particles Workshop," AAC Conf. Proc., vol. 91, pp. 1-9, 1982.